telescope. The two components are of nearly the same magnitude, and the angles may need to be increased by 180°.

	θ_o	ρ_o	Weight.
1897.715	30°.6	0″.23	3
.731	29 .9	0 .26	4
.797	28 .4	0 .28	2

R. G. AITKEN.

October 23, 1897.

THE *LEONIDS* IN 1897.

The *Leonids* were watched for from November 13th to November 18th, inclusive, but no unusual shower was seen. In fact, the displays were very meager, the greatest number being observed on the morning of November 17th, when nine *Leonids* were counted from $3^h\ 40^m$ to $4^h\ 30^m$ A.M. As the Moon was in this region of the heavens and near the time of last quarter, the conditions were not the best. C. D. P.

COMETS DUE TO RETURN IN 1898.

In the year 1898 there are no less than five periodic comets due to return to perihelion:—

Winnecke, March 20th; Encke, May 26th; Swift, 1889 VI; Wolf, June 30th; Temple's first periodic comet.

Of these comets, Winnecke's, Encke's, and Wolf's are well determined and should be found, except, perhaps, Wolf's which is so situated that it does not become very bright — only about two and a half times as bright as at the time of its rediscovery in 1891, when Professor BARNARD estimated it at thirteen and a half magnitude.

In the case of Swift's comet, there is an uncertainty of 0.9 year in the time of perihelion passage, which precludes any accurate prediction of its place, and hence renders impracticable any extended search with large telescopes. Those having small and moderate-sized telescopes will do well to devote some of their time to sweeping, with the chance of picking up this comet, and thereby save another from being added to the already long list of missing ones.

Temple's first periodic comet was observed at the returns of 1873 and 1879, subsequent to its discovery in 1867, but at the last two apparitions it was not seen. It is to be hoped that it may be rediscovered at the coming apparition.

The Temple–Swift comet (1869 III, 1880 IV, 1891 V) was due to pass perihelion on June 4th of the present year, but owing to the unfavorable situation of the Earth, the comet was always in the twilight, and being on the opposite side of the Sun from the Earth, its brightness was small, and hence was not found. Its next return should be more favorable. C. D. P.

MT. HAMILTON, November 20, 1897.

PHOTOGRAPH OF THE SPECTRUM OF A METEOR.

In Harvard College Observatory *Circular* No. 20, dated November 8, 1897, Professor E. C. PICKERING states that the spectrum of a meteor has been photographed for the first time.

At about 11 P.M. on June 18, 1897, when the eight-inch BACHE telescope (provided with a large objective prism) at Arequipa, Peru, was directed towards the constellation *Telescopium*, a bright meteor appeared in Right Ascension $18^h\ 19^m$, Declination $-47^\circ\ 10'$, and passed out of the field of view at Right Ascension $18^h\ 29^m$, Declination $-50^\circ\ 30'$.

Mrs. FLEMING'S examination of the photographic plate shows that the spectrum consists of six bright lines, whose intensity varies in different positions of the photograph, thereby showing that the light of the meteor changed as its image passed across the plate. The intensities of these lines are estimated at 40, 100, 2, 13, 10, and 10, respectively, and their wave lengths show that the first, second, fourth, and sixth lines are probably identical with the hydrogen lines H_ϵ, H_δ, H_γ, and H_β. The fifth line is probably identical with the band which forms the distinctive feature of the spectra of stars of the third class of the fifth type, and the third line, which is barely visible, is perhaps identical with another band contained in these stars.

The H_δ line is the most intense of the four hydrogen lines in the spectrum of the meteor. This is also the case in the spectrum of *o Ceti*, and of many other variable stars of long period. The relations between the other hydrogen lines also indicate an important resemblance between meteors and stars having bright lines in their spectra. These results may aid in determining the conditions of temperature and pressure in these bodies.

Professor PICKERING adds that special efforts will be made to photograph meteor trails and spectra during the November meteoric shower of this year. R. G. AITKEN.